

**REMARKS**

This Reply and Amendment is intended to be completely responsive to the non-final Office Action dated June 6, 2002.

**Declaration of M. Eric Taylor**

A Declaration of M. Eric Taylor dated April 6, 2000 was filed with the U.S. Patent and Trademark Office ("PTO") on April 6, 2000 in the prior U.S. Patent Application No. 09/337,830, which matured into U.S. Patent No. 6,117,594. The Declaration was also provided with the Reply and Amendment dated December 19, 2001 in the present Application.

**Claims**

Claims 30-71 have been rejected. Claims 62-63 and 70-71 are amended for clarity. Accordingly, Claims 30-71 are pending in the present Application.

The claim amendments and status of the claims are shown in Exhibit A "marked-up" to show all the changes relative to the previous version of the claims. 37 C.F.R. § 1.121. No new matter has been added.

**Claim Rejection -- Double Patenting**

On Page 4 of the Office Action, the Examiner rejected Claims 30-71 of the present Application under the judicially created doctrine of double patenting over Claims 1-33 of U.S. Patent No. 6,117,594 (the '594 patent). The Examiner stated:

A timely filed terminal disclaimer in compliance with 37 C.F.R. 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 C.F.R. 1.130(b).

The present Application and the '594 patent are commonly owned. An original assignment of the present Application from the originally named inventors to Johnson Controls Technology Company was filed for recordation in the U.S. PTO on October 22, 2002. An original assignment of the application that matured into the '594 patent (i.e. U.S. Patent Application No. 09/337,830 which is a continuation of

U.S. Patent Application No. 09/105,162) from the originally named inventors to Johnson Controls Technology Company was recorded in the U.S. PTO at Reel/Frame 9610/0765 on November 23, 1998.

The entire right, title and interest in the present Application and the '594 patent is in the Assignee seeking to obviate the rejection of Claims 30-71 of the present Application under the judicially created doctrine of double patenting over Claims 1-33 of the '594 patent. Accordingly, the rejection of Claims 30-71 under the judicially created doctrine of double patenting over Claims 1-33 of the '594 patent has been overcome.

**Claim Rejection -- 35 U.S.C. § 112 ¶ 2**

On Page 4 of the Office Action, the Examiner rejected dependent Claims 62 and 70-71 under 35 U.S.C. § 112 ¶ 2 as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. The Examiner stated:

Claim 62 recites "silver is in an amount of about 0 to 0.03%". Claim 62 depends from claim 57 which recites the amount of silver cannot be zero and is less than about 0.015%. Thus, claim 62 improperly broadens claim 57 from which the claim depends.

\* \* \*

If the changes made in the marked-up copy of the claims [filed March 28, 2002] were incorporated into pending claims 70 and 71, the 35 U.S.C. 112, 2<sup>nd</sup> paragraph, rejection would be overcome.

( Dependent Claim 62 has been amended for clarity to recite that "silver is in an amount of greater than about 0 to 0.015%" as prescribed by the Examiner. Dependent Claims 70 and 71 have been amended to incorporate the changes made in the marked-up copy of the claims filed March 28, 2002. Specifically, dependent Claim 70 has been amended to recite that "the active material is a paste," and dependent Claim 71 has been amended to recite a "lead-acid cell" as prescribed by the Examiner. Accordingly, the rejection of dependent Claims 62 and 70-71 under 35 U.S.C. § 112 ¶ 2 has been overcome.

**Claim Rejection -- 35 U.S.C. §§ 102 and 103(a)**

1. Rao et al. '186.

On Page 6 of the Office Action, the Examiner rejected Claims 30-38, 40-52, 54-56 and 71 under 35 U.S.C. § 102(e) as being anticipated by, and alternatively under 35 U.S.C. § 103(a) as being unpatentable over, U.S. Patent No. 5,874,186 ("Rao et al. '186"). The Examiner stated:

See Office Action of 2/27/01 for the reasons for rejection under 35 U.S.C. 102(e).

The claims are alternatively unpatentable under 35 U.S.C. 103(a) because while Rao '186 does not have a specific teaching within the claimed range of instant claims 30 and 44, unduly high silver levels may cause brittleness in the cast strip of the grid structure (see col. 16, lines 35-37). Rao further teaches that to the extent possible, the silver content should be minimized to reduce any effect on the oxygen overvoltage at the positive electrode of the lead acid cell (see col. 18, lines 15-19). Furthermore, Rao teaches the combination of the silver and tin ranges should be coordinated to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects (col. 16, lines 32-35). Thus, one of skill would be motivated to modify the silver and tin ranges to reduce the susceptibility of the directly cast strip to hot-cracks. One of skill would be motivated to minimize the silver contained in the lead alloy to reduce any effect on the oxygen overvoltage at the positive electrode and to minimize brittleness in the cast strip.

Rao et al. '186 states (col. 16, lines 28-37):

Inclusion of silver in the range of about 0.018% to about 0.030% and tin in the range of from about 0.6 or 0.65% to 1.25% provides high temperature corrosion resistance while minimizing creep-induced deformation. The combination of the silver and tin ranges should be coordinated to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects, particularly when casting strips with thickness greater than 0.040 inches. Unduly high tin and silver levels may cause brittleness in the cast strip particularly when thicker cross-section strips are being cast.

Claim 30 is in independent form. Claim 30 recites "a lead-acid cell for a battery" comprising, in combination with other elements, "a grid supporting structure having a layer of active material coupled thereto," "the grid supporting structure" comprising "a lead-based alloy" comprising "lead," "tin in the range of about 0.8% to about 1.1%," "calcium in an amount such that the ratio of tin to calcium is greater

than about 12:1," "silver in the range of greater than 0 to about 0.02%," "wherein the percentages are based upon the total weight of the lead-based alloy."

Claim 44 is in independent form. Claim 44 recites "a grid supporting structure for use in a lead-acid battery" comprising, in combination with other elements, "a layer of active material pasted" to the grid supporting structure, "the grid supporting structure" comprising "a lead-based alloy consisting essentially of lead," "tin in the range of about 0.8% to about 1.1%," "calcium in an amount such that the ratio of tin to calcium is greater than about 12:1," "silver in the range of greater than 0 to about 0.02%," "wherein the percentages are based upon the total weight of the lead-based alloy."

Claims 31-38, 40-43 and 71 depend from Claim 30. Claims 45-52 and 54-56 depend from Claim 44.

The combinations of elements recited in independent Claims 30 and 44 are not identically disclosed by Rao et al. '186 under 35 U.S.C. § 102(e). The "grid supporting structure" of Claims 30 and 44 comprising, in combination with other subject matter, a "lead-based alloy" having "tin" of about "0.8% to about 1.1%," "silver" less than "0.02%," and "calcium in an amount such that the ratio of tin to calcium is greater than about 12:1" is not identically disclosed by Rao et al. '186.

Rao et al. '186 purports to provide a disclosure of "silver in the range of about 0.018% to about 0.030%." However, the purported disclosure of Rao et al. '186 is not made with "sufficient specificity to constitute an anticipation" of Claims 30 and 44 under 35 U.S.C. § 102(e). See M.P.E.P. § 2131.03. The Examiner acknowledged that Rao et al. '186 "does not have a specific teaching within the claimed range of instant claims 30 and 44" (see Office Action at Page 6).<sup>1</sup>

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<sup>1</sup> The Examiner also acknowledged that the Specification of the present Application "provides clear evidence of unexpected results on page 19 for a silver range of 0.0030-0.0124% (outside the range of Rao) based on the total weight of the lead-based alloy." See Office Action at Page 3. See also Declaration of M. Eric Taylor dated April 6, 2000 at ¶¶ 11 and 19 (indicating that unexpected results were achieved within the claimed range).

As a whole, the combinations of elements recited in independent Claims 30 and 44 would not have been obvious over Rao et al. '186, a single reference, under 35 U.S.C. § 103(a). Rao et al. '186, alone or in any proper combination, does not disclose, teach or suggest the "grid supporting structure" of Claims 30 and 44.

*doesn't even address the "grid" by Ex.* → The suggestion to make the modification of Rao et al. '186 has been taken from the Applicants' own specification (using hindsight), which is improper. No suggestion or motivation to make the cited modification is present in Rao et al. '186. The only unambiguous (i.e. sufficiently specific) suggestion of Rao et al. '186 is to provide an alloy having 0.031% silver or greater.<sup>2</sup> The motivation to provide the "grid supporting structure" of Claims 30 and 44 having "silver" less than "0.02%" has been taken from the Applicants' own specification. Although Rao et al. '186 purports to provide a disclosure of "silver in the range of about 0.018% to about 0.030%," there is no unambiguous (i.e. sufficiently specific) disclosure, teaching or suggestion in Rao et al. '186 of the combinations as a whole recited in Claims 30 and 44. See Rao et al. '186 at col. 20, lines 34-38, col. 22, lines 13-15, col. 23, lines 12-26. Furthermore, to transform Rao et al. '186 to the "grid supporting structure" of Claims 30 and 44 would require still further modification (i.e. "tin" of "0.8% to about 1.1%" and "silver" less than "0.02%") and such modification is taught only by the Applicants' own specification.

*102 nty* → There is no identification or recognition in Rao et al. '186 of the beneficial effect and unexpected decrease in the cracking as identified by the Applicants in a combination including, among other elements, an alloy having the range of silver and tin as recited in Claims 30 and 44.

<sup>2</sup> See Rao et al. '186 at col. 20, lines 34-39, col. 22, lines 13-15, col. 23, lines 12-26 (emphasis added):

Alloy 1 (0.029% calcium, 0.049% tin, 0.032% silver and the remainder lead).

Alloy 2 (0.045% calcium, 0.48% tin, 0.031 [sic, %] silver and the remainder lead).

Alloy 3 (0.037% calcium, 0.45% tin, 0.032% silver and the balance lead).

The alloy composition used for the positive plate as follows: 0.028-0.036% Ca, 0.52% Sn, 0.036% Ag-Pb.

The subject matter recited in independent Claims 30 and 44, considered as a whole, is not identically disclosed by Rao et al. '186 under 35 U.S.C. § 102(e), and would not have been obvious over Rao et al. '186 under 35 U.S.C. § 103(a) to a person of ordinary skill in the art. The rejection of Claims 30-38, 40-52, 54-56 and 71 under 35 U.S.C. § 102(e) as being anticipated by, and alternatively under 35 U.S.C. § 103(a) as being unpatentable over, Rao et al. '186 is improper. Therefore, independent Claim 30 (and corresponding dependent Claims 31-38, 40-43 and 71) and independent Claim 44 (and corresponding dependent Claims 45-52 and 54-56) are patentable.

2. Rao et al. '087.

On Page 7 of the Office Action, the Examiner rejected Claims 30-71 under 35 U.S.C. § 102(b) as being anticipated by, and alternatively under 35 U.S.C. § 103(a) as being unpatentable over, U.S. Patent No. 5,691,087 ("Rao et al '087"), as evidenced by Rao et al. '186. The Examiner stated:

[T]he claims are anticipated.

The claims are alternatively unpatentable under 35 U.S.C. 103(a) because while Rao '087 does not have a specific teaching within the claimed range of instant claims 30, 44 and/or 57, unduly high silver levels may cause brittleness in the cast strip of the grid structure (evidenced by Rao '186, col. 16, lines 35-37). Rao '186 further teaches that to the extent possible, the silver content should be minimized to reduce any effect on the oxygen overvoltage at the positive electrode of the lead acid cell (see col. 18, lines 15-19). Furthermore, Rao '186 teaches the combination of the silver and tin ranges should be coordinated to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects (col. 16, lines 32-35). Thus, one of skill would be motivated to modify the silver and tin ranges of Rao '087 to reduce the susceptibility of the directly cast strip to hot-cracks. One of skill would be motivated to minimize the silver contained in the lead alloy of Rao '087 to reduce any effect on the oxygen overvoltage at the positive electrode and to minimize brittleness in the cast strip. This is evidenced by Rao '186.

Rao et al. '087 states (col. 10, lines 17-27):

The tin content of the alloys of the present invention can range from about 0.3 to about 0.9% or so, preferably from 0.3 to 0.6%, more preferably from 0.4 to 0.7%. . . . The silver content of the alloys of this invention ranges from about 0.015 to 0.045% based upon the total

weight of the alloy composition. It is preferred to maintain the silver content in the range of 0.025 to 0.045%, and, more preferably, from 0.03 to 0.040%.

Rao et al. '087 identifies four alloys (col. 20, lines 42-47, col. 22, lines 19-21, col. 23, lines 28-31):

Alloy 1 (0.029% calcium, 0.049% tin, 0.032% silver and the remainder lead).

Alloy 2 (0.045% calcium, 0.48% tin, 0.031 [sic, %] silver and the remainder lead).

Alloy 3 (0.037% calcium, 0.45% tin, 0.032% silver and the balance lead).

The alloy composition used for the positive plate as follows: 0.028-0.036% Ca, 0.52% Sn, 0.036% Ag-Pb.

Claim 30 is in independent form. Claim 30 recites "a lead-acid cell for a battery" comprising, in combination with other elements, "a grid supporting structure having a layer of active material coupled thereto," "the grid supporting structure" comprising "a lead-based alloy" comprising "lead," "tin in the range of about 0.8% to about 1.1%," "calcium in an amount such that the ratio of tin to calcium is greater than about 12:1," "silver in the range of greater than 0 to about 0.02%," "wherein the percentages are based upon the total weight of the lead-based alloy."

Claim 44 is in independent form. Claim 44 recites "a grid supporting structure for use in a lead-acid battery" comprising, in combination with other elements, "a layer of active material pasted" to the grid supporting structure, "the grid supporting structure" comprising "a lead-based alloy consisting essentially of lead," "tin in the range of about 0.8% to about 1.1%," "calcium in an amount such that the ratio of tin to calcium is greater than about 12:1," "silver in the range of greater than 0 to about 0.02%," "wherein the percentages are based upon the total weight of the lead-based alloy."

Claim 57 is in independent form. Claim 57 recites "a plate for use in a battery comprising a lead-based alloy" consisting essentially of "tin in an amount of about 0.8% to about 1.1%," "calcium in an amount such that the ratio of tin to calcium is greater than about 12:1," "silver in an amount of greater than 0 to about 0.015%," "wherein the percentages are based on the total weight of the lead based alloy."

Claims 31-43 and 71 depend from Claim 30. Claims 45-56 depend from Claim 44. Claims 58-70 depend from Claim 57.

The combinations of elements recited in independent Claims 30, 44 and 57 are not identically disclosed by Rao et al. '087 under 35 U.S.C. § 102(b). The "grid supporting structure" (Claims 30 and 44) or the "plate for use in a battery" (Claim 57) comprising, in combination with other subject matter, a "lead-based alloy" having "tin" of about "0.8% to about 1.1%," "silver" less than "0.02%" (Claims 30 and 44) or "0.015%" (Claim 57), and "calcium in an amount such that the ratio of tin to calcium is greater than about 12:1" is not identically disclosed by Rao et al. '087.

Rao et al. '087 purports to provide a disclosure of "the silver content of the alloys . . . from about 0.015 to 0.045%." However, the purported disclosure of Rao et al. '087 is not made with "sufficient specificity to constitute an anticipation" of Claims 30 and 44 under 35 U.S.C. § 102(b). See M.P.E.P. § 2131.03. The Examiner acknowledged that Rao et al. '087 "does not have a specific teaching within the claimed range of instant claims 30, 44 and/or 57" (see Office Action at Page 8).<sup>3</sup>

As a whole, the combinations of elements recited in independent Claims 30, 44 and 57 would not have been obvious over Rao et al. '087, a single reference, (or as evidenced by Rao et al. '186) under 35 U.S.C. § 103(a). Rao et al. '087, alone or in any proper combination, does not disclose, teach or suggest the "grid supporting structure" of Claims 30 and 44 or the "plate for use in a battery" of Claim 57.

Moreover, the suggestion to make the modification of Rao et al. '087 has been taken from the Applicants' own specification (using hindsight), which is improper. No suggestion or motivation to make the cited modification is present in Rao et al. '087. The only unambiguous (i.e. sufficiently specific) suggestion of Rao et al. '087 is to provide an alloy having 0.031% silver or greater. See Rao et al. '087 at col. 20, lines 42-47, col. 22, lines 19-21, col. 23, lines 28-31. The motivation to provide the "grid

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<sup>3</sup> The Examiner also acknowledged that the Specification of the present Application "provides clear evidence of unexpected results on page 19 for a silver range of 0.0030-0.0124% (outside the range of Rao) based on the total weight of the lead-based alloy." See Office Action at Page 3. See also Declaration of M. Eric Taylor dated April 6, 2000 at ¶¶ 11 and 19 (indicating that unexpected results were achieved within the claimed range).



supporting structure" of Claims 30 and 44 or the "plate for use in a battery" of Claim 57 having "silver" less than "0.02%" (Claims 30 and 44) or "0.015%" (Claim 57) has been taken from the Applicants' own specification. Although Rao et al. '087 purports to provide a disclosure of "the silver content of the alloys . . . from about 0.015 to 0.045%," there is no unambiguous (i.e. sufficiently specific) disclosure, teaching or suggestion in Rao et al. '087 of the combination as a whole recited in Claims 30, 44 and 57. See Rao et al. '087 at col. 20, lines 42-47, col. 22, lines 19-21, col. 23, lines 28-31. Furthermore, to transform Rao et al. '087 to the "grid supporting structure" of Claims 30 and 44 or the "plate for use in a battery" of Claim 57 would require still further modification (i.e. "tin" of "0.8% to about 1.1%" and "silver" less than "0.02%" (Claims 30 and 44) or "0.015%" (Claim 57)) and such modification is taught only by the Applicants' own specification.

102 mg ( There is no identification or recognition in Rao et al. '087 (or Rao et al. '186) of the beneficial effect and unexpected decrease in the cracking as identified by the Applicants in a combination, including, among other elements, an alloy having the range of silver and tin as recited in Claims 30, 44 and 57.

The subject matter recited in independent Claims 30, 44, and 57 considered as a whole, is not identically disclosed by Rao et al. '087 under 35 U.S.C. § 102(b), and would not have been obvious over Rao et al. '087 (as evidenced by Rao et al. '186) under 35 U.S.C. § 103(a) to a person of ordinary skill in the art. The rejection of Claims 30-71 under 35 U.S.C. § 102(b) as being anticipated by, and alternatively under 35 U.S.C. § 103(a) as being unpatentable over, Rao et al. '087, as evidenced by Rao et al. '186, is improper. Therefore, independent Claim 30 (and corresponding dependent Claims 31-43 and 71), independent Claim 44 (and corresponding dependent Claims 45-56) and independent Claim 57 (and corresponding dependent Claims 58-70) are patentable.

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It is submitted that each outstanding objection and rejection to the Application has been overcome, and the Application is in a condition for allowance. On entry of

this Reply and Amendment, Claims 30-71 will be pending in this Application. The Applicant requests reconsideration and allowance of all pending Claims 30-71.

The Examiner is invited to telephone the undersigned if such would advance the prosecution of the Application.

Respectfully submitted,

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**Exhibit A**  
**To Show All Changes Relative to Previous Version of the Claims**

1.-29. (Cancelled)

30.-61. (Pending)

62. (Once Amended) The plate of Claim 57 wherein the silver is in an amount of greater than about 0 to [0.03%] 0.015%.

63. (Once Amended) The plate of Claim 58 wherein the calcium is in an amount of about [0.03 to 0.055] 0.03% to 0.055%.

64.-69. (Pending)

70. (Once Amended) The plate of Claim [58 further comprising a container for an automotive battery] 59 wherein the active material is a paste.

71. (Once Amended) The [plate] lead-acid cell of Claim 30 wherein the silver is in an amount of about 0.005% to 0.015% [to 0.02%].